

# **Simulink® Verification and Validation™ Release Notes**



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## Summary by Version

This table provides quick access to what's new in each version. For clarification, see "Using Release Notes" on page 2.

<b>Version (Release)</b>	<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
<b>Latest Version V2.3 (R2008a)</b>	Yes Details	No	Bug Reports Includes fixes	Printable Release Notes: PDF  Current product documentation
V2.2 (R2007b)	Yes Details	No	Bug Reports Includes fixes	No
V2.1.1 (R2007a+)	No	No	Bug Reports Includes fixes	No
V2.1 (R2007a)	No	No	Bug Reports Includes fixes	No
V2.0 (R2006b)	Yes Details	No	Bug Reports Includes fixes	No
V1.1.2 (R2006a)	No	No	Bug Reports at Web site	No
V1.1.1 (R14SP3)	Yes Details	No	Bug Reports at Web site	No
V1.1 (R14SP2+)	Yes Details	No	Bug Reports at Web site	No
V1.0.2 (R14SP2)	No	No	Bug Reports at Web site	No
V1.0.1 (R14SP1)	No	No	Fixed bugs	No
V1.0 (R14)	Yes Details	No	Fixed bugs, and Additional Bug Fixes	No

## Using Release Notes

Use release notes when upgrading to a newer version to learn about:

- New features
- Changes
- Potential impact on your existing files and practices

Review the release notes for other MathWorks™ products required for this product (for example, MATLAB® or Simulink®) for enhancements, bugs, and compatibility considerations that also might impact you.

If you are upgrading from a software version other than the most recent one, review the release notes for all interim versions, not just for the version you are installing. For example, when upgrading from V1.0 to V1.2, review the release notes for V1.1 and V1.2.

## What's in the Release Notes

### New Features and Changes

- New functionality
- Changes to existing functionality

### Version Compatibility Considerations

When a new feature or change introduces a reported incompatibility between versions, the **Compatibility Considerations** subsection explains the impact.

Compatibility issues reported after the product is released appear under Bug Reports at the MathWorks Web site. Bug fixes can sometimes result in incompatibilities, so you should also review the fixed bugs in Bug Reports for any compatibility impact.

### Fixed Bugs and Known Problems

The MathWorks offers a user-searchable Bug Reports database so you can view Bug Reports. The development team updates this database at release time and as more information becomes available. This includes provisions

for any known workarounds or file replacements. Information is available for bugs existing in or fixed in Release 14SP2 or later. Information is not available for all bugs in earlier releases.

Access Bug Reports using your MathWorks Account.

## Version 2.3 (R2008a) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 2.3 (R2008a):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports Includes fixes	Printable Release Notes: PDF  Current product documentation

New features and changes introduced in this version are

- “Enhanced Coverage Support for Referenced Models” on page 4
- “New Requirements Submenu in Model Explorer” on page 5
- “Model Advisor Checks for Modeling Standards Enhanced” on page 5
- “API for Customizing Model Advisor Enhanced” on page 6

### Enhanced Coverage Support for Referenced Models

The previous release introduced coverage support for referenced models, but only by means of functions that you invoke programmatically. This release includes the following enhancements to coverage support for referenced models:

- Redesigned Coverage Settings dialog box now includes controls that allow you to enable coverage for referenced models graphically (see “Coverage Settings Dialog Box” in the *Simulink® Verification and Validation™ User’s Guide*).
- New Coverage by Model summary that allows you to navigate easily to coverage reports associated with referenced models in a hierarchy (see “About Model Coverage Reports” in the *Simulink Verification and Validation User’s Guide*).



## New Requirements Submenu in Model Explorer

Full access to the Requirements Management Interface is now available from within the Model Explorer. In this release, a **Requirements** submenu replaces the **Edit requirements** item that appears in Model Explorer context menus. This new submenu provides several options for adding requirements to model elements and specifying link preferences. This same submenu is available by right-clicking objects in a Simulink® model or a Stateflow® chart. For more information, see “Managing Model Requirements” in the *Simulink Verification and Validation User’s Guide*.

## Model Advisor Checks for Modeling Standards Enhanced

The Simulink Model Advisor has been enhanced with new and updated verification and validation checks.

- In the Task Hierarchy tree, the check category **By Product > Simulink Verification and Validation > Modeling Standards** includes the new subcategory **IEC 61508 Checks**.
- The **IEC 61508 Checks** subcategory includes new checks that help enforce and document adherence to coding standards for functional safety in electrical, electronic, and programmable electronic systems, as the IEC 61508 standard outlines. For descriptions of the IEC 61508 checks, see “Model Advisor Checks” in the Simulink Verification and Validation documentation.
- The IEC 61508 checks also appear under the new category **By Task > Model-Based Design for IEC 61508**.
- Some **MathWorks Automotive Advisory Board Checks** have been updated.

For Information on How To...	See...
Develop models and code that comply with industry standards and guidelines, such as the IEC 61508 standard and MathWorks Automotive Advisory Board (MAAB) guidelines	“Developing Models and Code That Comply with Industry Standards and Guidelines” in the Real-Time Workshop® Embedded Coder™ documentation

<b>For Information on How To...</b>	<b>See...</b>
Use the Model Advisor	“Consulting the Model Advisor” in <i>Using Simulink</i>
Customize the Model Advisor with your own tasks and checks	“Customizing the Model Advisor” in the <i>Simulink Verification and Validation User’s Guide</i>

## **API for Customizing Model Advisor Enhanced**

R2008a provides an enhanced API that allows you to customize the behavior of the Model Advisor for checking and reporting on how well your Simulink models are optimized for simulation and code generation. The API provides classes and functions for defining custom checks and tasks, and writing your own callback functions. For more information, see Customizing Model Advisor in the *Simulink Verification and Validation User’s Guide*.

## Version 2.2 (R2007b) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 2.2 (R2007b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports Includes fixes	No

New features and changes introduced in this version are

- “Model Coverage Support for Referenced Models” on page 7
- “Model Advisor Checks for Modeling Standards Enhanced” on page 7
- “API for Customizing Model Advisor HTML Reports ” on page 9

### Model Coverage Support for Referenced Models

This release introduces model coverage support for referenced models that operate in Normal mode. That is, you can now record coverage for Model blocks whose **Simulation mode** parameter specifies Normal. Toward that end, this release provides three new functions:

- `cvsimref`
- `cv.cvdatagroup`
- `cv.cvtestgroup`

For more information, see “Using Model Coverage Commands for Referenced Models” in the *Simulink® Verification and Validation™ User’s Guide*.

### Model Advisor Checks for Modeling Standards Enhanced

The Simulink® Model Advisor has been enhanced with new and updated verification and validation checks.

- In the Task Hierarchy tree, the check category **By Product > Simulink Verification and Validation > Modeling Standards** includes two new subcategories: **DO-178B Checks** and **MathWorks Automotive Advisory Board Checks**.
- The **DO-178B Checks** subcategory includes new checks that help enforce and document adherence to coding standards for DO-178B, Software Considerations in Airborne Systems and Equipment Certification. If a piece of software will be flying on a commercial aircraft, the development and verification process must comply with DO-178B. For descriptions of the DO-178B checks, see “Model Advisor Checks” in the *Simulink Verification and Validation User’s Guide*.
- The DO-178B checks also appear under the new category **By Task > Safety Critical for DO-178B**.
- Checks listed under **By Product > Simulink Verification and Validation > Modeling Standards** in earlier releases, appear under the new subcategory **MathWorks Automotive Advisory Board Checks**. These checks ensure that Simulink block diagrams adhere to style guidelines published by the MathWorks Automotive Advisory Board (MAAB).
- Some **MathWorks Automotive Advisory Board Checks** have been updated. For example, the check for “hd\_0001, Prohibited Simulink Sink and Data Store blocks” was modified to allow Data Store Memory, Data Store Read, and Data Store Write blocks and the check for “db\_0146, Triggered or enabled subsystems” was modified to include For Iterator, While Iterator, and Case blocks.

For Information on How To...	See...
Use the Model Advisor	“Consulting the Model Advisor” in <i>Using Simulink</i>
Customize the Model Advisor with your own tasks and checks	“Customizing the Model Advisor” in the <i>Simulink Verification and Validation User’s Guide</i>

## **API for Customizing Model Advisor HTML Reports**

This release provides a new API that allows you to customize Model Advisor HTML reports. The API provides classes and methods for formatting custom HTML reports, making it easier to create, understand, and maintain Model Advisor HTML reports. See “Formatting Model Advisor Outputs” in the *Simulink Verification and Validation User’s Guide*.

## Version 2.1.1 (R2007a+) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 2.1.1 (R2007a+):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	Bug Reports Includes fixes	No

## Version 2.1 (R2007a) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 2.1 (R2007a):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	Bug Reports Includes fixes	No

## Version 2.0 (R2006b) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 2.0 (R2006b):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports Includes fixes	No

New features and changes introduced in this version are

- “Requirement Links Checking” on page 12
- “Modeling Standards Checking” on page 12

### Requirement Links Checking

This release introduces Model Advisor tasks for ensuring the consistency and validity of requirement links in a Simulink® block diagram. These checks enable you to identify and fix the following situations:

- The requirements document is missing.
- The location (e.g., bookmark, line number, anchor) specified within the requirements document is invalid.
- The description of a selection-based link does not match its requirements document text.
- The requirements document path does not match your preferred path type (i.e., absolute or relative).

See “Consulting the Model Advisor” in *Using Simulink* for more information about using Model Advisor.

### Modeling Standards Checking

This release introduces Model Advisor tasks for ensuring that a Simulink block diagram adheres to the style guidelines published by the



MathWorks Automotive Advisory Board (MAAB). See “Consulting the Model Advisor” in *Using Simulink* for more information about using Model Advisor. For information about the MAAB modeling style guidelines, see <http://www.mathworks.com/industries/auto/maab.html>.

## Version 1.1.2 (R2006a) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 1.1.2 (R2006a):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	Bug Reports at Web site	No

## Version 1.1.1 (R14SP3) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 1.1.1 (R14SP3):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports at Web site	No

New features and changes introduced in this version are

- “API for Customizing the Model Advisor” on page 15
- “Upgrading from an Earlier Release” on page 15

### API for Customizing the Model Advisor

This release provides an API that allows you to customize the behavior of the Model Advisor for checking and reporting on how well your Simulink® models are optimized for simulation and code generation. The API provides classes and functions for defining custom checks and tasks, and writing your own callback functions. See “Customizing the Model Advisor” in the *Simulink® Verification and Validation™ User's Guide*.

### Upgrading from an Earlier Release

After upgrading to V1.1.1 (R14SP3), rerun the Requirements Management Interface setup script by typing the following command in the MATLAB® Command Window:

```
rmi setup
```

For more information, see “Configuring the Requirements Management Interface” in the *Simulink Verification and Validation User's Guide*.

## Version 1.1 (R14SP2+) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 1.1 (R14SP2+):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Bug Reports at Web site	No

New features and changes introduced in this version are

- “Support for New Location Types” on page 16
- “PDF Document Support” on page 17
- “Custom Requirements Documents” on page 17
- “Selection-Based Linking” on page 17
- “Navigation from Requirements Documents Using ActiveX® and Persistent Identifiers” on page 18
- “System Requirements Block for Displaying Requirements in a Diagram” on page 18
- “DOORS® Links Without a Surrogate” on page 19
- “DOORS® Synchronization Changes” on page 19
- “Menu Additions” on page 20

### Support for New Location Types

In previous releases, each document type had a single way of identifying locations. In this release, you can choose from several ways of identifying a location based on the type of document. For example, you can specify a line number location or a unique string location for a text file. You select the location type using a drop-down menu in the Requirements dialog box. For backward compatibility, the default location type is the same as previous releases.

The following table lists the new location types.

Document	Location Type	Format
Microsoft® Word file	Bookmark	Bookmark label, for example, mybookmark
	Page number	Page number, for example, 156
Microsoft® Excel® file	Named cell	Cell label, for example, totalSales
	Explicit range	Spreadsheet range, for example, A5 or B1:C4
Text file	Line number	Line number, for example, 21538
PDF file	Page number	Page number, for example, 156
	Named destination	Named destination label, for example, G5.1673

## PDF Document Support

PDF requirement documents are supported in this release. You can specify either a page number location or a named destination location within a document.

## Custom Requirements Documents

Custom requirement documents let you extend the requirement interface to new document types by supplying the M-code that is invoked to navigate to the document. For more information, see *Linking to Custom Types of Requirements Documents* in the *Simulink® Verification and Validation™ User's Guide*.

## Selection-Based Linking

Selection-based linking lets you create links to the currently selected text in a Word document, active cell in an Excel® workbook, or last selected object in Telelogic® DOORS® software without using the Requirements dialog box. This is the recommended way to establish requirement links to these documents.

When you use selection-based linking, the active Word document or Excel workbook is modified to include a new bookmark or named cell that uniquely identifies the location in the document. You can optionally modify the document to provide an icon for navigating from the requirement to the Simulink® object. For more information, see *Selection-Based Linking* in the *Simulink Verification and Validation User's Guide*.

## **Navigation from Requirements Documents Using ActiveX® and Persistent Identifiers**

The Simulink Verification and Validation software supplies an ActiveX® control to enable navigation from a requirements document to an object in a Simulink model. The ActiveX control is automatically inserted into Microsoft Word and Excel documents when you use selection-based linking.

You can use the ActiveX control in other applications to support custom interfaces between documents and Simulink models.

The Requirements Management Interface automatically creates unique identifiers for external navigation whenever you add a requirement link to a model object. The unique identifiers ensure that the correct item will be found after its name has been modified. The identifier is embedded in the property of the ActiveX control.

## **System Requirements Block for Displaying Requirements in a Diagram**

The System Requirements block in the new Simulink Verification and Validation block library lets you view the requirements for a subsystem or model directly on the block diagram for convenience, printing, and easy navigation.

When you place the System Requirements block in a diagram, it automatically updates the requirements list as you add, modify, or delete requirements for the model or subsystem. Double-clicking a requirement label in the System Requirements block navigates to the requirements document. For more information, see the System Requirements block reference page in the *Simulink Verification and Validation User's Guide*.

## **DOORS® Links Without a Surrogate**

In this release, you can establish requirement links directly to items in a Telelogic DOORS formal module without using a surrogate module. You can combine DOORS® links with links to other document types and add them before or after the optional synchronization.

## **DOORS® Synchronization Changes**

Telelogic DOORS software synchronization is now an optional process that is needed only if you want to enable further analysis within the DOORS software, use various tracking tools that are built on top of the DOORS software, or use the DOORS software as an alternative to storing requirements information in the model.

## **Synchronization Settings**

Several synchronization settings are available to control the way the surrogate module is created and managed. You can configure these settings by using the DOORS settings dialog box, which is automatically opened whenever you start synchronization. The synchronization settings are saved with the model.

## **Control over Model Detail**

You can control the objects that are inserted into the DOORS surrogate module. In prior releases, all the model objects were inserted into the surrogate, resulting in extremely large and detailed surrogate modules and long synchronization times. Now you can specify that only the items with DOORS requirement links are placed in the surrogate, or you can choose a desired detail level to make the surrogate better reflect the model.

## **Synchronization of Link Information**

By default, links between DOORS surrogate items and DOORS requirement items are imported into the Simulink software during synchronization. Similarly, links between model objects and DOORS requirement items are exported to the DOORS software during synchronization. You can disable these options by using the DOORS settings dialog box.

When both options are enabled, link information is merged between the Simulink model and the DOORS surrogate modules so that each representation has complete linking information.

### **Ability to Specify Surrogate Path**

You can choose the surrogate module arbitrarily by browsing the hierarchy in the DOORS software. It is identified uniquely with its creation number that is stored in the model. It is no longer necessary to ensure that the DOORS software is started in a particular project.

### **Menu Additions**

In this release, the Simulink Verification and Validation software provides some additional menu items to improve usability and simplify the workflow.

The Simulink **Tools** menu now contains a **Requirements** item that provides access to several commonly used utilities.

- **Link settings** — Opens the Selection-based linking dialog box, which lets you open the external applications and specify preferences for selection-based linking.
- **Generate Report** — Generates a report on all the requirements associated with the model and its blocks.
- **Highlight model** — Highlights all the blocks in the Simulink diagram that have requirements associated with them.
- **Synchronize with DOORS** — Synchronizes the Simulink model with a formal module in a Telelogic DOORS project.

When you right-click a Simulink or Stateflow® object and select **Requirements** from the resulting pop-up menu, you see a list of requirement links for the selected object and some additional menu items.

- **Add link to Word selection** — Makes a selection-based link to a Microsoft Word document.
- **Add link to active Excel cell** — Makes a selection-based link to a Microsoft Excel document.



- **Add link to current DOORS object** — Makes a selection-based link to a Telelogic DOORS object.
- **Edit/Add links** — Opens the Requirements dialog box.
- **Link settings** — Opens the Selection-based linking dialog box, which lets you open the external applications and specify preferences for selection-based linking.

## Version 1.0.2 (R14SP2) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 1.0.2 (R14SP2):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	Bug Reports at Web site	No

## Version 1.0.1 (R14SP1) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 1.0.1 (R14SP1):

<b>New Features and Changes</b>	<b>Version Compatibility Considerations</b>	<b>Fixed Bugs and Known Problems</b>	<b>Related Documentation at Web Site</b>
No	No	Fixed bugs	No

## Version 1.0 (R14) Simulink® Verification and Validation™ Software

This table summarizes what's new in Version 1.0 (R14):

New Features and Changes	Version Compatibility Considerations	Fixed Bugs and Known Problems	Related Documentation at Web Site
Yes Details below	No	Fixed bugs, and Additional Bug Fixes	No

New features and changes introduced in this version are

- “New Requirements Manager” on page 24
- “New Verification Manager” on page 24
- “New Model Coverage Features” on page 25
- “Additional Bug Fixes” on page 26

### New Requirements Manager

The new Requirements Manager replaces the old Requirements Manager Interface (RMI) tool. The new Requirements Manager includes requirement descriptions and links to Microsoft® Word (.doc), Microsoft® Excel® (.xls), and HTML documents, which are mapped directly to Simulink® and Stateflow® model elements. The new Requirements Manager is fully compatible with models that already map requirements with the old RMI tool. For a detailed description of this new feature, see *Managing Modeling Requirements* in the *Simulink® Verification and Validation™ User's Guide*.

### New Verification Manager

The GUI interface for the Signal Builder block now includes a new Verification Manager to manage the verification blocks in a model. From this central location, you can construct configurations of verification blocks to accompany each test group. Each of these configurations enables, disables, and override enables individual verification blocks to assert during testing. For a detailed

description of this new feature, see Managing Verification Blocks in the *Simulink Verification and Validation User's Guide*.

## **New Model Coverage Features**

### **Signal Range Analysis Report**

This new feature provides a report at the bottom of the standard Model Coverage report with the maximum and minimum signal values at each block in the model measured during simulation.

For details on this new feature, see “Signal Range Analysis Report” in the *Simulink Verification and Validation User's Guide*.

### **N-Dimensional Lookup Table Report**

This report section displays an interactive chart that summarizes the extent to which elements of a lookup table are accessed. The report contains up to  $n$  two-dimensional tables representing the elements of the lookup table. Each cell contains a shade of the color green representing the number of execution counts for its lookup value. If you click an individual table cell, you receive a dialog that displays the index location of the cell and the exact number of execution counts generated for it during testing.

For details on this new feature, see N-Dimensional Lookup Table Report in the *Simulink Verification and Validation User's Guide*.

### **Colored Simulink® Diagram Coverage Display**

Model coverage displays results for individual blocks directly in Simulink diagrams as follows:

- Highlights (colors) blocks that have received model coverage during simulation.
- Provides a context-sensitive display of summary model coverage information for each block.

For details on this new feature, see “Colored Simulink Diagram Coverage Display” in the *Simulink Verification and Validation User's Guide*.

## **Additional Bug Fixes**

This version includes additional bug fixes, listed here:

### **Problems with Objects Not Synchronizing**

In many cases, Simulink blocks and especially Stateflow objects (states, junctions, transitions, and so on) did not synchronize and appear in the DOORS® synchronized module. This has been fixed by the new Requirements Management Interface.

### **Problems with the Navigator**

Numerous bugs have been reported with the Requirements Navigator GUI. This GUI has been deprecated in favor of integrating requirements directly into Simulink models with the new Requirements Management Interface.

### **Problems with Navigating to Requirements**

Numerous bugs have been reported with navigation to text, HTML, and Excel® files requirements documents through the old Requirements Management Interface Navigator. These issues have been fixed in the new Requirements Management Interface.

## Compatibility Summary for Simulink® Verification and Validation™ Software

This table summarizes new features and changes that might cause incompatibilities when you upgrade from an earlier version, or when you use files on multiple versions. Details are provided in the description of the new feature or change.

<b>Version (Release)</b>	<b>New Features and Changes with Version Compatibility Impact</b>
<b>Latest Version V2.3 (R2008a)</b>	None
V2.2 (R2007b)	None
V2.1.1 (R2007a+)	None
V2.1 (R2007a)	None
V2.0 (R2006b)	None
V1.1.2 (R2006a)	None
V1.1.1 (R14SP3)	None
V1.1 (R14SP2+)	None
V1.0.2 (R14SP2)	None
V1.0.1 (R14SP1)	None
V1.0 (R14)	None